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LOYOLA UNIVERSITY CHICAGO

EFFECTS OF DISCRETE POSITIVE EMOTIONS ON ATTITUDE CHANGE

A THESIS SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
MASTER OF ARTS

PROGRAM IN APPLIED SOCIAL PSYCHOLOGY

BY

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CHICAGO, ILLINOIS

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ABSTRACT

This study examines the influence of discrete incidental positive emotions (joy and contentment) on participants' attitudes and cognitive responses. Prior persuasion research has focused almost exclusively on negative emotions or comparisons between positive and negative moods. A 2 (argument strength: weak or strong) x 3 (emotional state: joy, contentment, or neutral) between-participants factorial design was used in this study. Participants ($N = 460$) were randomly assigned to one of six experimental conditions. Analyses revealed consistent argument strength effects on attitudes and cognitive responses. Compared to the joy and neutral conditions, participants in the contentment condition tended to generate fewer positive cognitive responses. However, the hypothesis that contentment and joy are associated with different process-style effects was not supported. Suggestions for future research are discussed.

EFFECTS OF DISCRETE POSITIVE EMOTIONS ON ATTITUDE CHANGE

Attitude change has been a major research focus in social psychology research since World War II (Lumsdaine, 1984). Research on the relation between affect and attitude change has primarily focused on negative emotions or the role of positive and negative moods (Rucker & Petty, 2004). Recently, research has started to address the role of specific emotions during persuasion; however, much of this research is limited to negative emotions or happiness (with some exceptions, e.g., Tiedens & Linton, 2001). This study seeks to fill this gap in the research by examining whether discrete positive emotions have differential effects on attitude change.

Background Literature

Background literature related to attitude change will be presented first, followed by a brief review of research on positive emotions.

Attitude Change

Attitudes are relatively enduring evaluations of people, objects, or concepts that are stored in the memory (Petty & Wegener, 1998). Persuasion is the process of changing a person's attitudes—either forming a new attitude or shifting an existing attitude to a more positive or negative valence. During the persuasion process, people are exposed to a persuasive communication containing counterattitudinal messages. The attended-to information is cognitively processed, and then this processing may (or may not) lead to an attitude change. The elaboration likelihood model provides a

theoretical framework for discussing the factors and mechanisms involved in attitude change.

Elaboration Likelihood Model. The elaboration likelihood model is a multi-process model of persuasion (Petty & Cacioppo, 1986a; Petty, Rucker, Bizer, & Cacioppo, 2004; Petty & Wegener, 1998). The model does not propose one specific process for attitude change or attitude formation. Rather, the processes involved in shaping people's attitudes depend on how much they are thinking about the persuasive message. The amount of thinking or cognitive elaboration that occurs varies along the elaboration continuum. The central and peripheral routes are the endpoints along the elaboration continuum. During central route processing, people engage in high levels of cognitive elaboration in which they produce self-generated arguments that support or oppose the communicated message. In contrast, low levels of cognitive elaboration occur during peripheral processing.

The amount of cognitive elaboration that people engage in depends upon their level of motivation and ability (Petty & Wegener, 1998). Two individuals exposed to the same persuasive message may engage in different levels of elaboration and process the message differently based on individual differences and situational determinants. Individual differences that affect motivation to process include personal relevance, interest in topic, and involvement. Some situational determinants of motivation are incentives and accountability. Individual differences that determine people's ability to elaborate include general intelligence, expertise, and need for cognition, and situational

factors affecting ability to produce cognitive elaborations include distractions, complexity of language, and time pressure.

Individuals who have high levels of motivation and ability will engage in central processing (Petty & Wegener, 1998). During central route processing, people carefully scrutinize messages and generate cognitive responses. Cognitive responses are self-generated arguments that support or oppose the persuasive message. The quality of the message arguments influences the favorability of people's cognitive responses. When exposed to strong arguments, people produce positive cognitive responses that can lead to more favorable attitudes about the issue. However, people generate negative cognitive responses to weak arguments, which can lead to unfavorable attitudes. Attitudes formed through central processing tend to be more enduring and more predictive of behavior than attitudes formed through peripheral processing.

People engage in peripheral processing when they have low motivation or ability to elaborate (Petty & Wegener, 1998). Rather than evaluating message arguments, people engaging in peripheral processing tend to rely on cues and heuristics (e.g., source attractiveness or expertise) to form their evaluations. Compared to central processing, attitudes formed through peripheral processing are more temporary and less predictive of behaviors.

Message, source, context, and other persuasion variables can take on different roles depending on the level of cognitive elaboration (Petty & Wegener, 1998). The multiple ways that affect may influence attitude change will be discussed following an introduction to positive emotions.

Positive Emotions

Throughout this paper, affect will be used as a higher-level term that includes both mood and emotion. Mood and emotions will be used to refer to two phenomenologically distinct forms of affect. Both moods and emotions are episodic. Emotions are intense, they form quickly, and they have an identifiable referent. Emotions form in response to situations that have positive or negative implications for an individual's goals and concerns (Schwarz & Clore, 2007). In contrast, moods are more global experiences. Moods are feelings that can occur more gradually, last for longer periods of time, and lack a specific referent. Moods can be the result of emotions that have decreased in intensity and the specific referent is no longer salient (Schwarz & Clore, 2007).

The relative emphasis on negative emotions over positive emotions can be found in most areas of psychological research, not only attitude change. There are several potential explanations for the relative emphasis on negative emotions, including the greater number of distinct negative emotions compared to positive emotions and the general tendency in psychology to focus on understanding and solving problems (Fredrickson, 1998).

Fredrickson and colleagues (Fredrickson, 1998; Fredrickson & Branigan, 2005; Fredrickson & Cohn, 2008) developed the broaden-and-build theory to account for the unique properties of positive emotions, including contentment, joy, love, interest, pride, and gratitude. The broaden-and-build theory proposes that positive emotions temporarily expand thought-action repertoires leading people to engage in a greater variety of thoughts and behaviors compared to when experiencing negative emotions or neutral states. Positive emotions have been associated with increased scope of cognitions and

attention (Fredrickson & Branigan, 2005). Positive and negative emotions are associated with different adaptive benefits. Previous researchers have proposed that negative emotions activate specific action tendencies (e.g., Frijda, 1986; Lazarus, 1991). Negative emotions enable individuals to deal with dangerous or threatening situations, while positive emotions lead to the development of skills and resources (for a review, see Fredrickson & Branigan, 2005). The remainder of this section will provide an overview of two positive emotions—joy and contentment.

Joy. Researchers have not agreed upon a definition of “joy” as an emotion (de Rivera, Possel, Verette, & Weiner, 1989; Ellsworth & Smith, 1988; Izard, 2000). Fredrickson (1998) describes joy as a high-arousal positive emotion that occurs in safe environments, during times of low levels of effort or hardships, or in response to achievements. Play or “free activation” is the thought-action repertoire associated with joy. Play is associated with the development of social, mental, and physical resources that persist beyond the joyful state. In addition, Izard (2000) proposes that joy enhances creative problem solving and speeds the flow of ideas. Joy may also occur in situations that involve meaningful social interactions (de Rivera et al., 1989) and attainment of goals (Ellsworth & Smith, 1988).

Contentment. Contentment has received less research attention than joy. Contentment is a low-arousal positive emotion that occurs in safe situations, during low levels of effort, and in high certainty (Fredrickson, 1998). The thought-action repertoires associated with contentment are increased levels of reflection, savoring of life experiences, and an integration of these experiences into self and worldviews (Fredrickson, 1998). Izard

(2000) describes contentment as being of lesser intensity compared to joy, and the two emotions may also differ in the associated cognitions, imagery, and activation level.

Affect and Attitude Change

Most research on attitude change and affect has focused on the overall positive or negative valence of the affect (Petty, Fabrigar, & Wegener, 2003; Rucker & Petty, 2004). Studies have typically examined differences between positive and negative moods, without differentiating among types of positive and negative moods. Previous research has found that affect may influence attitude change differently depending on the level of cognitive elaboration (Petty et al., 2003; Petty, Gleicher, & Baker, 1991).

During low levels of elaboration, affect may function as a heuristic and lead to an assimilation effect. When there is an assimilation effect, positive moods or emotions lead to more favorable attitudes, and negative moods or emotions lead to less favorable attitudes. People assess their “feelings” about an object or issue and assume these feelings reflect their attitude toward the object. Misattribution effects may occur when people mistake their incidental mood for their feelings in regards to the attitude object.

During high levels of elaboration, affect may have an assimilation effect on attitudes. This effect may occur as a result of affect functioning as information or evidence that is integrated into the evaluation of the attitude object (Schwarz, Bless, & Bohner, 1991). In addition, assimilation effects are found when affect leads to biased information processing. For example, mood may influence the interpretation of ambiguous message arguments and retrieval of mood-congruent information.

Finally, during moderate levels of elaboration, affect may determine the processing style used when evaluating the persuasive message (central versus peripheral processing routes). In general, previous research has found that positive moods and emotions are associated with lower levels of cognitive processing of message arguments compared to processing during negative affect (Petty et al., 1991, 2003). Researchers have developed several theories to explain this finding. According to the mood-congruent cognition hypothesis, mood states increase the activation of and accessibility of mood-congruent cognitions (Mackie & Worth, 1989). The increased activation of associated cognitions during positive mood reduces the amount of cognitive resources available to process the message, so people engage in lower level elaborations (Mackie & Worth, 1989). The affect-as-information theory proposes that mood and emotions provide information about the environment (Schwarz et al., 1991). Negative affect signals a problem in the environment, which in turn, leads to more systematic thinking. In contrast, positive affect signals that the situation is fine, so people engage in lower effort, heuristic thinking. Finally, the hedonic-contingency theory (Wegener, Petty, & Smith, 1995) proposes that people have a desire to repair negative mood and prolong or intensify positive mood. People engage in systematic processing to improve negative moods, but avoid it to maintain positive moods.

More recently, researchers have started to investigate the impact of specific emotion on attitude change (Rucker & Petty, 2004). However, many of these studies focused on different emotions of the same valence (primarily negative). For example, DeSteno, Petty, Rucker, Wegener, and Braverman (2004) examined the influence of sad

and angry incidental emotions on participants' attitude change. Greater amounts of attitude change occurred when the participant's emotional state matched the emotional framing of the message. This relationship was mediated by increased likelihood estimates of message arguments when the emotional state and message frame matched.

Research Questions

This study examined whether positive emotions have differential effects on people's attitude change when they are exposed to strong or weak persuasive messages. Participants were assigned to one of six conditions in the 2 (argument strength: strong or weak) x 3 (emotional state: content, joyful, or neutral) factorial design. Four hypotheses were tested.

Hypothesis 1

There will be an assimilation effect of emotional state on attitude change when pooling across argument strength conditions. Compared to the neutral condition, participants in the positive emotion conditions are expected to report more positive attitudes toward the communication topic.

Hypothesis 2

There will be a main effect of argument strength on attitude toward the communication, collapsing across emotion conditions. Participants in the strong argument condition are expected to report more favorable attitude change compared to participants in the weak argument condition.

Hypothesis 3

There will be a two-way interaction between emotion and argument strength on attitude toward the communication. It is predicted that the participants' processing styles

will be affected by their emotional state. Being in a joyful emotional state is expected to result in a smaller argument strength effect compared to the neutral and contentment conditions. In contrast, participants in the content emotional condition are expected to display larger argument strength effects compared to the other two emotional conditions.

These process-style effects are anticipated for several reasons. The high arousal level associated with joy is expected to reduce participants' cognitive capacities, and consequently, inhibit cognitive elaboration of the message arguments to a greater extent than contentment. In addition, participants in the joy condition (compared to contentment) may be more motivated to maintain their current positive emotional state, and as a consequence may use heuristic processing. Finally, contentment may lead to increased levels of reflection and integration of ideas into a coherently unified representation; therefore, participants in the content condition are expected to engage in more in-depth processing of the message arguments compared to the joy condition. The current study is not focused on determining which of these mediating processes are responsible for the results.

Hypothesis 4

Process-style effects are also expected to be apparent in the cognitive responses generated by the participants. In the strong argument condition, participants in the content condition are expected to generate a more favorable cognitive responses compared to the participants in the joy condition. However, in the weak condition, participants in the content condition are expected to generate more unfavorable cognitive responses.

PILOT TEST

In order to test the hypotheses, emotion manipulation materials were developed to activate joyful, content, or neutral feelings in the participants. Previous researchers (e.g., de Rivera et al., 1989; Ellsworth & Smith, 1988; Schwarz & Clore, 1983; Tiedens & Linton, 2001) demonstrated that requesting participants to recall and re-experience past positive events in their lives is an effective technique for inducing specific positive emotions. In this study, emotion was manipulated by asking participants to recall and write about a joyful, content, or neutral experience.

Before conducting the main study, the emotion manipulation materials were pilot tested to ensure that the materials elicited distinct forms of joy, contentment, and neutral affect. Participants in the contentment condition were expected to have a significantly higher contentment score compared to the joy and neutral conditions. In addition, participants in the joyful condition were predicted to have a significantly higher joy score compared to the remaining conditions.

Method

The current section provides an overview of the participants, design, procedure, and materials for the pilot test.

Participants

Participants ($N = 59$, female = 50) were undergraduate students enrolled in an introductory psychology course at Loyola University Chicago. The ages of the participants ranged from 18 to 38 ($M = 19.2$, $SD = 2.68$). Participants were predominantly White/Caucasian (71.2%) and in their first year of college (79.7%).

Participants signed up for the study through Experimentix, an online program that schedules data collection sessions. Participants received class credit to compensate them for their time.

Design

Participants were randomly assigned to one of the three emotion manipulation conditions: joy ($n = 20$), contentment ($n = 20$), or neutral ($n = 19$).

Procedure

The pilot test was conducted online using Opinio, a program used to develop and administer surveys online. Once participants signed up for the study, they received an email with a link to the survey website. In the first part of the survey, participants read the informed consent form and received instructions about participating in the study. The remainder of the survey consisted of the emotion manipulation (joy, contentment, or neutral) and the emotion manipulation check. After completing the questionnaire, participants were thanked, debriefed, and assigned class credit.

Materials

Emotional manipulation. In order to induce positive emotions, participants were asked to vividly recall a positive emotional experience in which they felt joyful, content, or neutral (see Appendix A). The general instructions for the manipulation were adapted from procedures used by Ellsworth and Smith (1988), and Schwartz and Clore (1983). The joy and contentment descriptions were based on Fredrickson's definitions of these emotions. A meta-analysis examining the effectiveness of various mood induction

techniques reported a mean effect size (r_m) of .359 for this type of manipulation (Westerman, Spies, Stahl, & Hesse, 1996).

To reduce the effects of hypothesis guessing, a cover story was used to mask the real purpose of the emotion manipulation. Participants were told that they were participating in the development of a Life-Events Inventory (Schwarz & Clore, 1983). Participants were given the following cover story:

We would like your help in the development of a “life-event inventory”—a test instrument to assess events in people’s lives. The following instructions will ask you to think about and describe a specific emotional event in your life. Your description of this event will help us generate items for the life-event inventory.

Participants were then asked to think of a specific event from their life.

Participants in the joyful condition were asked to think of a time when they felt extremely joyful (i.e., “Please try to recall a previous pleasant emotional experience in which you felt extremely joyful. When you were feeling joyful, you may have had the urge to be playful or creative.”). Participants in the content condition were asked to think of a time when they felt extremely content (i.e., “Please try to recall a previous pleasant emotional experience in which you felt extremely content. When you were feeling content, you may have had the urge to sit back and savor the experience.”). Participants in the neutral condition were asked to think of a time when they did not feel particularly positive or negative (i.e., “Please try to recall a previous experience in which you felt neutral. When you were feeling neutral, you were not experiencing any positive or negative emotions.”). Participants then received the following instructions:

Try and remember *as vividly as you can* what this past situation was like. Take a minute to think back and *re-experience* the emotions that you were feeling during this experience. What happened? How did you feel? Please briefly describe the pleasant emotional experience that you recalled.

After thinking about the experience, participants were asked to write a detailed description of their positive experiences to intensify the emotional experience. Participants then reported when the event occurred (e.g., “How long ago did this event happen?”).

Emotion manipulation check. The emotion measure and the self-assessment manikin were used to assess whether participants in the content, joy, and neutral conditions reported differences in their experienced emotions and arousal levels.

Emotion measure. Based on procedures adapted from Fredrickson and Branigan (2005), participants were provided with a list of ten emotions and asked to report the extent to which they felt each emotion (e.g., “Please indicate how strongly you felt each emotion when you recalled your positive emotional experience.”). Participants responded using a 9-point scale (0 = *none*, 8 = *a great deal*). Emotions included amusement, anger, anxiety, contentment, disgust, fear, joy, pride, sadness, and thankfulness. A Negative Emotions subscale was calculated by averaging participant responses to the anger, anxiety, disgust, fear, and sadness items ($\alpha = .78$).

Self-assessment manikin. The Self-Assessment Manikin (SAM; Lang, 1980) was one of two measures used to verify the emotion manipulation. The measure consisted of two 9-point pictorial rating scales that measure current levels of pleasure and arousal (e.g., “In the scale below, please report how you felt when you were remembering your pleasant emotional experience.”). The pleasure scale is comprised of a series of figures

with facial expressions that range from a smile (9 = *extremely happy*) to a frown (1 = *extremely unhappy*). Similarly, the arousal scale is comprised of a series of figures that range from a figure with motion lines and an energy burst (9 = *extremely excited*) to a figure with sleepy eyes and no signs of energy or movement (1 = *extremely calm*).

Results

In order to assess the effectiveness of the emotion manipulation, one-way, between-subjects analysis of variances (ANOVAs) with planned contrasts were used to examine differences in reported emotions across conditions. Planned contrasts revealed that participants in the content condition ($M = 7.15$, $SD = 1.18$) reported significantly higher levels of contentment compared to participants in the joy ($M = 5.85$, $SD = 2.70$) and neutral conditions ($M = 2.63$, $SD = 2.77$), $t(56) = 4.54$, $p < .001$, $r = .52$. This suggests that the contentment emotion manipulation was successful.

Planned contrasts revealed that participants in the joy condition ($M = 7.10$, $SD = 1.48$) reported significantly higher levels of joyfulness compared to participants in the content ($M = 7.05$, $SD = 1.32$) and neutral conditions ($M = 1.67$, $SD = 2.27$), $t(55) = 5.77$, $p < .001$, $r = .31$. Planned contrasts also revealed that participants in the joy condition ($M = 6.30$, $SD = 2.32$) reported significantly higher levels of arousal compared to participants in the content ($M = 5.55$, $SD = 2.09$) and neutral conditions ($M = 3.84$, $SD = 1.83$), $t(56) = 2.78$, $p = .004$, $r = .35$. These results suggest that the joy emotion manipulation was successful.

Planned contrasts revealed that participants in the neutral condition ($M = 5.05$, $SD = 1.43$) reported significantly lower levels of pleasure compared to participants in the

content ($M = 8.25$, $SD = 1.02$) and joy conditions ($M = 8.40$, $SD = 1.14$), $t(56) = 9.74$, $p < .001$, $r = .79$. This suggests that the neutral emotion manipulation was successful.

Summary

A pilot test was conducted to validate the emotion manipulation. Joyful, content, and neutral moods were induced by instructing participants to recall and describe a time when they felt joyful, content, or neutral. As predicted, participants in the joy, content, and neutral conditions differed on measures of joyfulness, contentment, pleasure, and arousal. The results of the pilot test indicate that the emotion manipulation procedures were successful, and they suggest that these manipulations can be used effectively in the main study.

MAIN STUDY

Having validated the emotion manipulation procedures in the pilot test, the main study was conducted to directly test the research hypotheses.

Method

The current section provides an overview of the participants, design, procedure, and materials for the main study.

Participants

A convenience sample of Introduction to Psychology students at Loyola University Chicago participated in the study for class credit ($N = 460$, 64.6% female).

The ages of the participants ranged from 18 to 28 years ($M = 18.91$, $SD = 1.22$).

Participants were predominantly White/Eastern European (68.5%) and in their first year

of college (71.7%). As in the pilot test, participants signed up for the study online through Experimentix.

Design

The study used a 2 (argument strength: weak or strong) x 3 (emotional state: joy, contentment, or neutral) between-participants factorial design. The dependent variables were the degree of attitude change and cognitive responses.

Procedure

The study was conducted online using Opinio survey software. Participants were randomly assigned to one of the six experimental conditions: emotional state (joy, contentment, or neutral) crossed with argument quality (strong or weak). Participants then read the informed consent form and received instructions about participating in the study. In order to reduce hypothesis guessing and to boost the emotion manipulation, participants were told that they were participating in two separate tasks. The emotion manipulation was conducted in the first task, and participants were told that they were participating in the development of a Life-Event Inventory (as described in the Pilot Study). Participants were told that the second part of the study focused on their attitudes, thoughts, and feelings about university-related issues.

Participants completed an online questionnaire that consisted of nine sections: 1) emotion manipulation (joy, contentment, or neutral); 2) persuasive message (weak or strong argument strength); 3) attitude measure; 4) cognitive response listing; 5) need for cognition scale; 6) involvement in issue measures; 7) affect intensity measure; 8) emotional response

listing; and 9) demographics sheet. After completing the questionnaire, participants were thanked, debriefed, and assigned class credit.

Experimental Manipulations

The argument strength quality presented in the message and the participants' incidental emotional states are manipulated in this study.

Argument strength. Materials developed by Petty and Cacioppo (1986b) were used to manipulate argument strength (see Appendix B). Participants read a message about the benefits of instituting comprehensive exams as part of the requirements for graduation at Loyola University Chicago. Depending on the condition, participants received either strong or weak message arguments. The quality of the arguments in the strong and weak conditions differed, while the length and surface features of the messages were the same in both argument strength conditions. During high levels of elaboration, strong messages were expected to lead to more favorable attitudes, and weak messages were expected to lead to less favorable attitudes.

Emotion manipulation. This study used the same emotion manipulations as in the pilot test.

Dependent Measures

Attitude change and cognitive responses to the persuasive message were the dependent variables measured in this study. Additional measures of need for cognition, involvement in the issue, dispositional affect intensity, emotions experienced, and demographic variables were also collected.

Attitude change. After reading the persuasive message, participants responded to four semantic differential items (e.g., “Do you believe that instituting a comprehensive exam requirement at Loyola University Chicago would be...?”; adapted from DeSteno et al., 2004). Participants reported their answers on 7-point scales (e.g., 1 = *bad*, 7 = *good*; 1 = *harmful*, 7 = *beneficial*; 1 = *foolish*, 7 = *wise*; and 1 = *negative*, 7 = *positive*). Responses to these four items were averaged together for an overall attitude score ($\alpha = .94$).

Cognitive responses. Participants were asked to report all of the thoughts that they had while they read the comprehensive exam message: “In the space below, please report all of the thoughts that you had while reading the comprehensive exam message (whether positive, negative, or neutral).”

Participant responses were then parsed into separate cognitive responses. The cognitive responses were coded using the following coding scheme: a) relevance or irrelevance of cognitive response to issue topic; b) restatement or elaboration of message; and c) positive, negative, or neutral valence. The following variables were created from the cognitive response coding: 1) total number of relevant cognitive responses; 2) proportion of positive cognitive responses; 3) proportion of negative cognitive responses, 4) proportion of neutral responses, and 5) summed valence of the cognitive responses.

Need for cognition. Need for cognition is an individual difference variable related to the tendency to engage in and enjoy high-effort cognitive processing (Cacioppo et al., 1984). People who are high on need for cognition tend to engage in central route processing, while people low in need for cognition tend to use peripheral route processing. Need for cognition was assessed with an 18-item scale (Cacioppo, Petty, & Kao, 1984).

Participants were asked to read a series of statements and indicate whether the statement was characteristic of them (e.g., “I prefer complex to simple problems” and “I find satisfaction in deliberating hard and for long hours”). Participants responded using a 7-point scale (1 = *extremely uncharacteristic*, 7 = *extremely characteristic*). Items were reverse-coded, so that higher scores reflected greater levels of need for cognition. Responses to the 18 items were averaged together into an overall measure of need for cognition ($\alpha = .86$).

Involvement in issue. Participants rated their levels of interest in the topic, knowledge about the topic, and perceived importance of the topic (e.g., “How interested are you in the issue of comprehensive exam requirements?,” “How much do you know about the issue of comprehensive exam requirements?,” and “How important to you is the issue of comprehensive exam requirements?”). Participants responded using a seven-point scale (1 = *none*, 7 = *a great deal*). There was a strong positive correlation between issue interest and issue importance, $r(456) = .66, p < .001$. Issue interest and issue importance were averaged together for a combined measure of issue involvement ($\alpha = .79$).

Affect intensity measure. The 40-item Affect Intensity Measure (Larson & Diener, 1987) assessed how intensely people tend to experience positive emotions. Participants responded to items about their emotional reactions to daily events (e.g., “I feel pretty bad when I lie” and “When I solve a small problem I feel euphoric”). Participants responded using a six-point (1 = *Never*, 6 = *Always*). Items were reverse-coded, so that higher scores reflected greater levels of affect intensity. Responses to the 40 items were averaged together into an overall measure of affect intensity ($\alpha = .88$).

Emotional response listing. Participants were asked to report all of the feelings that they had while they read the comprehensive exam message (e.g., “In the space below, please report all of the feelings that you had while reading the comprehensive exam message (whether positive, negative, or neutral).”).

Demographics. Participants were asked to report demographic information, including gender, age, class year, expected grade point average, and race/ethnicity.

Results

This section summarizes the statistical analysis strategy and the results. The emotion manipulation check is presented first. The remaining analyses are divided into four main sections. The first two sets of analyses included all participants, and the final two sets of analyses focused only on participants in the joy and content conditions. In these analyses, emotion was operationalized in two ways—manipulated emotion and measured emotion. For the manipulated emotion analyses, participants were grouped based on the type of emotion manipulation they completed during the study (i.e., joy, content, or neutral). For the measured emotion analyses, participants’ joy and contentment scores were used to construct a continuous variable that reflects the extent to which participants reported experiencing joy and contentment during the study.

Emotion Manipulation Check

The descriptions of positive life events were reviewed to ensure that the participants followed the instructions for the emotion manipulation. Participants were excluded from the analyses if they wrote about a situation in which they experienced negative emotions. For instance, some participants described feeling bittersweet or ambivalent about the event

(mixtures of positive and negative emotions). In addition, participants in the joy condition were excluded from the analyses if they described a situation where they felt low arousal positive emotions (e.g., feeling serene, relaxed, calm, or content). Participants in the content condition were excluded if they described feeling high arousal positive emotions (e.g., excitement, elation, or joy). Finally, participants in the neutral condition were excluded if they described feeling positive emotions or if they described numbness or dissociation from the experience.

Overall, responses from 79 participants (17% of total sample) were excluded from the study (content/strong arguments: $n = 20$; content/weak arguments: $n = 10$; joy/strong arguments: $n = 8$; joy/weak arguments: $n = 6$; neutral/strong arguments: $n = 20$; neutral/weak arguments: $n = 15$). Four of these participants were excluded because they did not provide a written description of the life event. The remainder of the participants were excluded because of technical malfunctions related to the online survey program ($n = 33$) or because they failed to follow the emotion manipulation instructions ($n = 42$).

For the remaining cases, one-way ANOVAs with planned contrasts were conducted as a second manipulation check to ensure that participants in the different emotion conditions experienced different emotions as intended. Planned contrasts revealed that participants in the content condition ($M = 6.34$, $SD = 1.91$) reported significantly higher levels of contentment compared to participants in the joy ($M = 5.70$, $SD = 2.14$) and neutral conditions ($M = 4.23$, $SD = 2.60$), $t(378) = 5.60$, $p < .001$, $r = .28$. These results suggest that the contentment emotion manipulation was successful.

Planned contrasts revealed that participants in the joy condition ($M = 6.45$, $SD = 1.77$) reported significantly higher levels of joyfulness compared to participants in the content ($M = 6.03$, $SD = 2.03$) and neutral conditions ($M = 2.60$, $SD = 2.42$), $t(373) = 9.62$, $p < .001$, $r = .45$. Planned contrasts also revealed that participants in the joy condition ($M = 6.00$, $SD = 1.97$) reported significantly higher levels of arousal compared to participants in the content ($M = 5.50$, $SD = 2.16$) and neutral conditions ($M = 3.40$, $SD = 1.92$), $t(377) = 7.19$, $p < .001$, $r = .35$. These results suggest that the joy emotion manipulation was successful.

Planned contrasts revealed that participants in the neutral condition ($M = 5.48$, $SD = 1.37$) reported significantly lower levels of pleasure compared to participants in the content ($M = 7.71$, $SD = 1.22$) and joy conditions ($M = 7.72$, $SD = 1.43$), $t(378) = 15.08$, $p < .001$, $r = .61$. This suggests that the neutral emotion manipulation was successful.

Manipulated Emotion x Argument Strength Analyses: Full Sample

The next round of analyses examined the effects of manipulated emotional state and argument strength on participants' attitudes and cognitive responses toward instituting comprehensive examinations. It was hypothesized that strong (vs. weak) arguments would be associated with more favorable attitudes and cognitive responses, participants in the joy and content conditions would report more favorable attitudes and cognitive responses compared to people in the neutral condition, and there would be significant argument strength x emotion condition interactions (i.e., process-style effect). More specifically, it was predicted that participants in the content condition would display greater levels of

systematic processing, while participants in the joy condition would show greater levels of heuristic processing.

Effects of manipulated emotion and argument strength manipulations on attitudes. A 2 (argument strength: weak, strong) x 3 (emotional state: joy, contentment, neutral) between-subjects ANOVA was conducted on people's reported attitudes (for means and standard deviations, see Table 1). As predicted, there was a significant main effect of argument strength, $F(1, 375) = 52.10, p < .001, \eta^2 = .12$. People in the strong argument condition ($M = 4.74, SD = 1.39$) reported significantly more favorable attitudes compared to people in the weak argument condition ($M = 3.73, SD = 1.35$). However, there was not a significant main effect of emotional state, $F(2, 375) = .394, p = .675, \eta^2 = .00$. Participants in the contentment ($M = 4.12, SD = 1.44$), joy ($M = 4.28, SD = 1.37$), and neutral ($M = 4.23, SD = 1.59$) conditions did not significantly differ on the favorability of their attitudes. In addition, there was not a significant argument strength x emotional state interaction, $F(2, 375) = .178, p = .837, \eta^2 = .00$. This finding suggests that the relationship between argument strength and attitudes was not affected by people's incidental positive emotions. This analysis only provided support for the argument strength hypothesis. As expected, higher quality arguments resulted in more favorable attitudes. However, the emotion condition manipulation did not appear to influence attitudes.

Effects of manipulated emotion and argument strength on cognitive responses.

All of the following analyses were conducted using 2 (argument strength: weak, strong) x 3 (emotional state: joy, contentment, neutral) between-subjects ANOVAs.

Number of cognitive responses. The effects of argument strength and emotion condition on the total number of relevant cognitive responses generated was analyzed (see Table 2). Generating higher numbers of cognitive responses is an indicator of greater depth of information processing (i.e., systematic or central-route processing). The main effect of argument strength was not significant, $F(1, 363) = 0.03, p = .872, \eta^2 = .00$. People in the strong ($M = 3.52, SD = 1.79$) and weak argument condition ($M = 3.56, SD = 2.06$) did not generate significantly different numbers of relevant cognitive responses. The main effect of emotional state was also not significant, $F(2, 363) = 0.66, p = .514, \eta^2 = .00$. Participants in the joy ($M = 3.46, SD = 2.15$), content ($M = 3.70, SD = 1.92$), and neutral ($M = 3.48, SD = 1.67$) conditions did not generate significantly different amounts of relevant cognitive responses.

Table 1

Mean Attitude Ratings of Participants in the Joy, Content, and Neutral Conditions as a Function of Argument Strength (with Standard Deviations in Parentheses)

	Emotion Manipulation Condition			
	Joy	Content	Neutral	Pooled
Strong Arguments	4.78 (1.35)	4.72 (1.30)	4.73 (1.55)	4.74 (1.39)
Weak Arguments	3.81 (1.21)	3.58 (1.35)	3.78 (1.50)	3.73 (1.35)
Pooled	4.28 (1.37)	4.12 (1.44)	4.23 (1.59)	4.21 (1.46)

Table 2

Mean Cognitive Responses Generated by Participants in the Joy, Content, and Neutral Conditions as a Function of Argument Strength (Standard Deviations in Parentheses)

	Emotion Manipulation Condition			
	Joy	Content	Neutral	Pooled
Strong Arguments	3.26 (1.68)	3.98 (2.10)	3.35 (1.48)	3.52 (1.79)
Weak Arguments	3.65 (2.51)	3.44 (1.72)	3.60 (1.82)	3.57 (2.06)
Pooled	3.46 (2.15)	3.70 (1.92)	3.48 (1.67)	3.54 (1.93)

In addition, the argument strength x emotional state interaction was not statistically significant, $F(2, 363) = 2.04, p = .132, \eta^2 = .01$. This suggests that the relationship between the number of relevant cognitive responses generated and attitudes does not depend on whether people received strong or weak arguments.

Net valence of cognitive responses. The effects of the argument strength and emotion manipulations on the net valence of the cognitive responses were examined (see Table 3). There was a significant main effect of argument strength on net valence of the cognitive responses, $F(1, 363) = 26.95, p < .001, \eta^2 = .07$. People in the strong argument condition ($M = -0.41, SD = 2.41$) generated significantly more positive cognitive responses compared to people in the weak argument condition ($M = -1.66, SD = 2.17$). In addition, there was a trend toward a main effect of emotional state, $F(2, 363) = 2.36, p = .096, \eta^2 = .01$. The cognitive responses of participants in the content condition ($M = -$

1.43, $SD = 2.33$) had a more negative net valence compared to participants in the joy ($M = -0.91$, $SD = 2.39$) and neutral ($M = -0.89$, $SD = 2.33$) conditions. However, Tukey's HSD post hoc comparisons were not significant. The argument strength x emotional state interaction on net valence was not significant, $F(2, 363) = 2.24$, $p = .108$, $\eta^2 = .01$.

Proportion of positive cognitive responses. The next analysis explored the effects of argument strength and emotion condition on the proportion of positive cognitive responses generated (see Table 4). There was a significant main effect of argument strength, $F(1, 363) = 28.01$, $p < .001$, $\eta^2 = .07$. People in the strong argument condition ($M = 0.41$, $SD = 0.37$) generated a significantly greater proportion of positive cognitive responses compared to people in the weak argument condition ($M = 0.23$, $SD = 0.27$).

Table 3

Net Valence of Cognitive Responses of Participants in the Joy, Content, and Neutral Conditions as a Function of Argument Strength (Standard Deviations in Parentheses)

	Emotion Manipulation Condition			Pooled
	Joy	Content	Neutral	
Strong Arguments	-0.03 (2.26)	-1.14 (2.65)	-0.11 (2.20)	-0.41 (2.41)
Weak Arguments	-1.74 (2.23)	-1.68 (2.00)	-1.56 (2.29)	-1.66 (2.17)
Pooled	-0.91 (2.39)	-1.42 (2.33)	-0.89 (2.36)	-1.07 (2.37)

There was also a significant main effect of emotional state, $F(2, 363) = 3.74, p = .025, \eta^2 = .02$. Participants in the content condition ($M = 0.25, SD = 0.29$) generated a significantly smaller proportion of positive cognitive responses compared to participants in the joy ($M = 0.34, SD = 0.36$) and neutral ($M = 0.35, SD = 0.34$) conditions. Post-hoc Tukey's HSD tests showed that participants in the contentment condition generated a significantly lower proportion of positive cognitive responses compared to the neutral condition ($p = .041$). In addition, the difference in the proportion of positive cognitive responses generated by participants in the contentment and joy conditions was marginally significant ($p = .070$). All other comparisons were not statistically significant.

Finally, there was not a statistically significant argument strength x emotional state interaction, $F(2, 363) = 2.11, p = .123, \eta^2 = .01$. This indicates that the relationship between the proportion of positive cognitive responses and emotions does not differ when people read strong or weak arguments.

Proportion of negative cognitive responses. The next analysis explored the effects of argument strength and emotion condition on the proportion of negative cognitive responses generated (see Table 5). There was a significant main effect of argument strength, $F(1, 363) = 19.21, p < .001, \eta^2 = .05$. People in the strong argument condition ($M = 0.46, SD = 0.37$) generated a significantly smaller proportion of negative cognitive responses compared to people in the weak argument condition ($M = 0.62, SD = 0.35$). However, there was not a significant main effect of emotional state, $F(2, 363) = 1.09, p = .338, \eta^2 = .01$.

Table 4

Proportion of Positive Cognitive Responses Generated by Participants in the Joy, Content, and Neutral Conditions as a Function of Argument Strength (Means with Standard Deviations in Parentheses)

	Emotion Manipulation Condition			Pooled
	Joy	Content	Neutral	
Strong Arguments	.48 (.40)	.30 (.32)	.44 (.37)	.41 (.37)
Weak Arguments	.21 (.26)	.20 (.26)	.27 (.30)	.23 (.27)
Pooled	.34 (.36)	.25 (.29)	.35 (.34)	.31 (.34)

Table 5

Proportion of Negative Cognitive Responses Generated by Participants in the Joy, Content, and Neutral Conditions as a Function of Argument Strength (Means with Standard Deviations in Parentheses)

	Emotion Manipulation Condition			Pooled
	Joy	Content	Neutral	
Strong Arguments	.40 (.37)	.52 (.35)	.46 (.37)	.46 (.37)
Weak Arguments	.63 (.35)	.64 (.34)	.59 (.35)	.62 (.35)
Pooled	.52 (.38)	.58 (.35)	.53 (.37)	.54 (.36)

Participants in the joy ($M = 0.52$, $SD = 0.38$), content ($M = 0.58$, $SD = 0.35$), and neutral ($M = 0.53$, $SD = 0.37$) conditions did not generate significantly different proportions of negative cognitive responses. In addition, the argument strength x emotional state interaction was not statistically significant, $F(2, 363) = 0.85$, $p = .427$, $\eta^2 = .00$. This suggests that the relationship between the proportion of negative cognitive responses and attitudes does not depend on whether people received strong or weak arguments.

Summary. Overall, these analyses provide clear support for the hypothesis that participants who read strong message arguments would form more positive attitudes and cognitive responses compared to people who read weak message arguments.

Unexpectedly, however, these analyses provide no support for the hypothesis that participants in the positive emotion conditions (i.e., joy and contentment) would report more favorable attitudes and cognitive responses compared to participants in the neutral condition. In contrast, participants in the content condition tended to display a more negative net valence of cognitive responses and generated a smaller proportion of positive cognitive responses compared to participants in the joy and neutral conditions. Furthermore, these analyses provide no evidence of differences in information-processing style.

Measured Emotion x Argument Strength Analyses: Full Sample

Additional analyses were conducted to further explore whether feelings of joy and contentment had differential effects on the favorability of participants' attitudes toward instituting comprehensive exams. Participants in all conditions were asked to report how joyful and content they felt. There was a significant correlation between joy and

contentment scores, $r(373) = .69, p < .001$. This suggests that many of the participants recalled experiences where they experienced a blend of joy and contentment. Some participants experienced high levels of joy and contentment, while other participants experienced higher levels of one emotion than the other. For this reason, categorizing participants based on the emotion manipulation they received does not fully reflect the amount of joy and contentment the participants reported actually experiencing. Therefore, further analyses were conducted using participants' measured emotion levels, rather than the manipulated emotion condition, as the independent variable.

To account for the levels of joy and contentment within participants, difference scores were calculated by subtracting contentment ratings from joy ratings. Extremely positive difference scores reflect ratings of “pure” joy—high levels of joy and low levels of contentment. Extremely negative difference scores reflect ratings of “pure” contentment—high levels of contentment and low levels of joy. Across all participants, the joy-contentment difference scores ranged from -8 to +8 ($M = -.34, SD = 2.70$).

Effects of manipulated emotion and argument strength manipulations on attitudes. The joy-contentment difference score, argument strength, and cross-product interaction term were simultaneously entered into a multiple regression as predictors of attitude scores. The predictors accounted for 13% of the variance in attitude scores, $F(3, 372) = 19.08, p < .001, \eta^2 = .13$. There was a significant main effect of argument strength, $t(374) = 7.34, p < .001, r = .35$. People exposed to strong arguments had more favorable attitudes compared to people exposed to weak arguments, $b = 1.04, \beta = 0.35$. There was not a significant main effect of the joy-contentment difference score on

attitudes, $t(374) = -0.88, p = .382, r = .05$. The experienced levels of joy and contentment did not predict the favorability of participants' attitudes, $b = -0.07, \beta = -0.13$. In addition, the interaction between argument strength and the joy-contentment difference score was not statistically significant, $t(374) = 1.37, p = .173, r = .07$.

Effects of measured emotion and argument strength on cognitive responses.

Multiple regression analyses were used to analyze the effects of measured emotion and argument strength on cognitive responses. The joy-contentment difference score, the argument strength condition, and the cross-product interaction term were entered into the regression as simultaneous predictors.

Number of cognitive responses. The predictors did not account for a significant amount of variance in the total number of relevant cognitive responses, $F(3, 360) = 1.35, p = .259, \eta^2 = .01$.

Net valence of cognitive responses. The predictors accounted for 8% of the variance in the net valence of cognitive responses, $F(3, 360) = 10.55, p < .001, \eta^2 = .08$. There was a significant main effect of argument strength, $t(362) = 5.29, p < .001, r = .27$. People exposed to strong arguments generated more positive cognitive responses compared to people exposed to weak arguments, $b = 1.27, \beta = .27$. The main effect of emotional state was not significant, $t(362) = 0.08, p = .936, r = .00$. In addition, the argument strength x joy-content difference score interaction was not significant, $t(362) = 0.54, p = .593, r = .03$.

Proportion of positive cognitive responses. The predictors accounted for 8% of the variance in the proportion of positive cognitive responses, $F(3, 360) = 9.97, p < .001$,

$\eta^2 = .08$. There was a significant main effect of argument strength, $t(362) = 5.37, p < .001, r = .27$. People exposed to strong arguments generated more positive cognitive responses compared to people exposed to weak arguments, $b = 0.18, \beta = 0.27$. The main effect of emotional state was not significant, $t(362) = -0.88, p = .379, r = .05$. In addition, the argument strength x joy-content difference score interaction was not significant, $t(362) = 0.96, p = .339, r = .05$.

Proportion of negative cognitive responses. The predictors accounted for 6% of the variance in the proportion of negative cognitive responses, $F(3, 360) = 7.85, p < .001, \eta^2 = .06$. There was a significant main effect of argument strength, $t(362) = -4.55, p < .001, r = .23$. People exposed to strong arguments generated fewer negative cognitive responses compared to people exposed to weak arguments, $b = -0.17, \beta = -0.23$. The main effect of emotional state was not significant, $t(362) = -0.55, p = .581, r = .03$. In addition, the argument strength x joy-content difference score interaction was not significant, $t(362) = 0.01, p = .995, r = .00$.

Summary. As in the previous set of analyses using the manipulated emotions, stronger arguments predicted more favorable attitudes and cognitive responses. Overall, the joy-contentment difference score was not a predictor of attitudes or cognitive responses, and there were no significant interactions between argument strength and the joy-content difference score.

Manipulated Emotion x Argument Strength Analyses: Joy and Content Only

The primary purpose of this study was to assess whether feelings of joy and contentment have different effects on the way that people process persuasive messages.

The neutral condition was originally included as a baseline measure. However, a direct comparison of responses from people in the joy and contentment conditions may reveal subtle effects that were masked by the inclusion of the neutral condition. In the next round of analyses, only participants in the joy and contentment conditions were included in the analyses ($n = 260$). For this sample, there was a significant positive correlation between attitude and the net valence of cognitive responses, $r(252) = .66, p < .001$.

Effects of manipulated emotion and argument strength manipulations on attitudes. A 2 (argument strength: weak, strong) x 2 (emotional state: joy, contentment) between-subjects ANOVA was conducted on people's reported attitudes. The main effect of argument strength was statistically significant, $F(1, 256) = 42.63, p < .001, \eta^2 = .14$. People in the strong argument condition ($M = 4.75, SD = 1.32$) reported significantly more favorable attitudes compared to people in the weak argument condition ($M = 3.70, SD = 1.28$). However, there was not a significant main effect of emotional state, $F(2, 256) = 0.838, p = .361, \eta^2 = .00$. Participants in the contentment ($M = 4.12, SD = 1.44$) and joy ($M = 4.28, SD = 1.37$) conditions did not significantly differ on the favorability of their attitudes. In addition, there was not a significant argument strength x emotional state interaction, $F(2, 256) = 0.838, p = .602, \eta^2 = .00$.

Effects of manipulated emotion and argument strength manipulations on cognitive responses. All of the following analyses were conducted using a 2 (argument strength: weak, strong) x 2 (emotional state: joy, contentment) between-subjects ANOVA on the cognitive response variables. When the interaction was significant, independent samples t -tests were used to explore the simple effects.

Total number of relevant cognitive responses. The effects of argument strength and emotion condition on the total number of relevant cognitive responses generated was analyzed. The main effect of argument strength was not significant, $F(1, 249) = 0.082, p = .775, \eta^2 = .00$. People in the strong ($M = 3.60, SD = 1.91$) and weak argument condition ($M = 3.55, SD = 2.17$) did not generate different numbers of relevant cognitive responses. The main effect of emotional state was also not significant, $F(1, 249) = 0.99, p = .320, \eta^2 = .00$. Participants in the joy ($M = 3.46, SD = 2.15$) and content conditions ($M = 3.70, SD = 1.92$) did not generate significantly different amounts of relevant cognitive responses. The argument strength x emotional state interaction was marginally significant, $F(1, 249) = 3.25, p = .072, \eta^2 = .01$. This suggests that the relationship between the number of relevant cognitive responses generated and attitudes depends on whether people received strong or weak arguments.

Simple effects tests were conducted to determine the nature of the argument strength x emotional state interaction (see Figure 1). The first analysis revealed that for people in the weak argument condition, participants in the joy ($M = 3.65, SD = 2.51$) and content ($M = 3.44, SD = 1.72$) conditions did not differ on the total number of relevant cognitive responses generated, $t(130) = -0.55, p = .584, r = .05$. However, for people in the strong argument condition, participants in the joy condition ($M = 3.26, SD = 1.68$) generated fewer relevant cognitive responses compared to people in the content condition ($M = 3.98, SD = 2.10$), $t(119) = 2.09, p = .038, r = .19$.

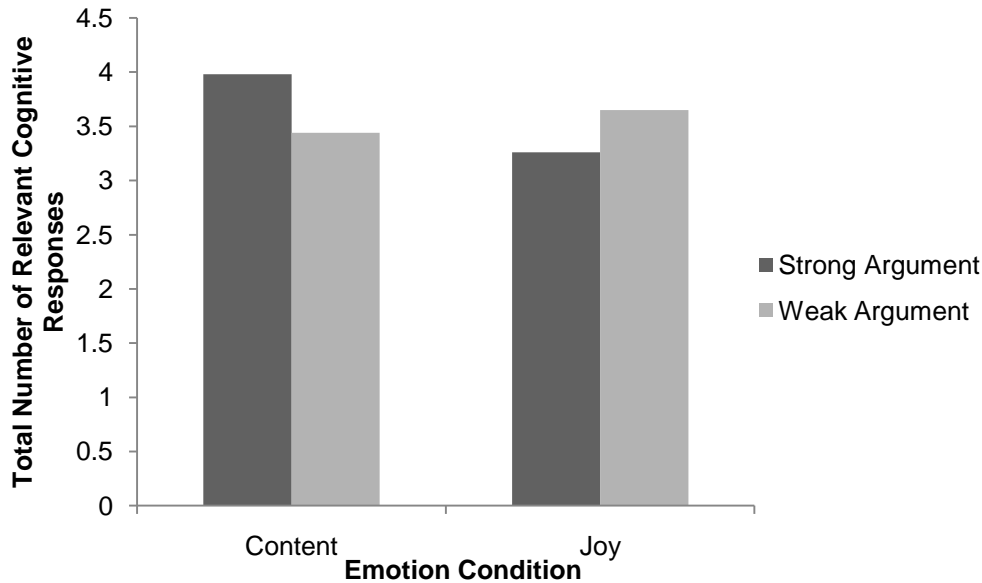


Figure 1. Effects of argument strength and emotion condition on total number of relevant cognitive responses.

Valence of cognitive responses. The effects of argument strength and manipulated emotion condition on the overall valence of the cognitive responses were examined. There was a significant main effect of argument strength, $F(1, 249) = 15.22, p < .001, \eta^2 = .06$. People in the strong argument condition ($M = -0.55, SD = 2.50$) generated significantly more positive cognitive responses compared to people in the weak argument condition ($M = -1.71, SD = 2.12$). In addition, there was a marginally significant main effect of emotional state, $F(1, 249) = 3.35, p = .068, \eta^2 = .01$. Participants in the joy condition ($M = -0.91, SD = 2.39$) generated more positive cognitive responses compared to participants in the content condition ($M = -1.43, SD = 2.33$). In addition, there was a significant argument strength x emotional state interaction, $F(1, 249) = 4.11, p = .044, \eta^2 = .02$.

This indicates that the relationship between the valence of the cognitive responses and attitudes depended on whether people receive strong or weak arguments.

Simple effects tests were conducted to determine the nature of the argument strength x emotional state interaction (see Figure 2). The first analysis revealed that for people in the weak argument condition, participants in the joy ($M = -1.74$, $SD = 2.23$) and content ($M = -1.68$, $SD = 1.99$) did not differ on the overall valence of the cognitive responses that they generated, $t(130) = 0.15$, $p = .879$, $r = .01$. However, for people in the strong argument condition, participants in the joy condition ($M = -0.03$, $SD = 2.26$) generated significantly more positive cognitive responses compared to participants in the content condition ($M = -1.14$, $SD = 2.65$), $t(119) = -2.49$, $p = .014$, $r = .22$.

Proportion of positive cognitive responses. The next analysis explored the effects of argument strength and emotion condition on the proportion of positive cognitive responses generated. There was a significant main effect of argument strength, $F(1, 249) = 20.89$, $p < .001$, $\eta^2 = .07$. People in the strong argument condition ($M = 0.39$, $SD = 0.37$) generated a significantly greater proportion of positive cognitive responses compared to people in the weak argument condition ($M = 0.21$, $SD = 0.26$). There was also a significant main effect of emotional state, $F(1, 249) = 5.16$, $p = .024$, $\eta^2 = .02$.

Participants in the joy condition ($M = 0.34$, $SD = 0.36$) generated a significantly greater proportion of positive cognitive responses compared to participants in the content condition ($M = 0.25$, $SD = 0.29$). In addition, there was a significant argument strength x emotional state interaction, $F(1, 249) = 4.26$, $p = .040$, $\eta^2 = .02$.

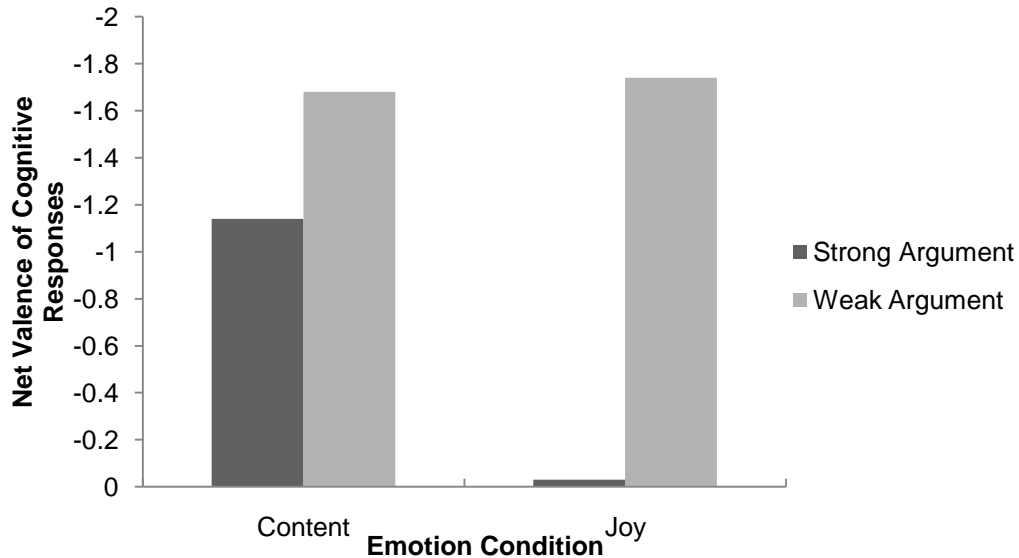


Figure 2. Effects of argument strength and emotion condition on valence of cognitive responses.

This indicates that the relationship between the proportion of positive cognitive responses and attitudes depends on whether people read strong or weak arguments.

Simple effects tests were conducted to determine the nature of the argument strength x emotional state interaction (see Figure 3). The first analysis revealed that for people in the weak argument condition, participants in the joy ($M = 0.21$, $SD = 0.26$) and content ($M = 0.20$, $SD = 0.26$) did not differ on the proportion of positive cognitive responses generated, $t(130) = -0.18$, $p = .857$, $r = .01$. However, for people in the strong argument condition, participants in the joy condition ($M = .48$, $SD = .40$) generated a significantly greater proportion of cognitive responses compared to people in the contentment condition ($M = .30$, $SD = .32$) condition did not differ on the of positive cognitive responses generated, $t(119) = -2.59$, $p = .011$, $r = .23$.

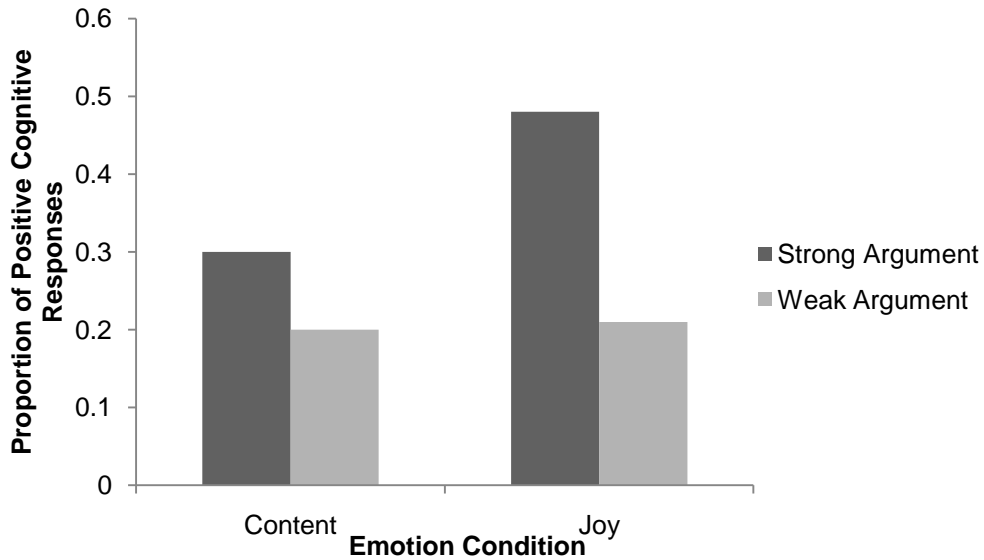


Figure 3. Effects of argument strength and emotion condition on the proportion of positive cognitive responses generated.

Proportion of negative cognitive responses. The next analysis explored the effects of argument strength and emotion condition on the proportion of negative cognitive responses generated. There was a significant main effect of argument strength, $F(1, 249) = 15.53, p < .001, \eta^2 = .06$. People in the strong argument condition ($M = 0.46, SD = 0.37$) generated a significantly smaller proportion of negative cognitive responses compared to people in the weak argument condition ($M = 0.63, SD = 0.34$). However, there was not a significant main effect of emotional state, $F(1, 249) = 1.93, p = .167, \eta^2 = .01$.

Participants in the joy condition ($M = 0.52, SD = 0.38$) and content condition ($M = 0.58, SD = 0.35$) did not generate significantly different proportions of negative cognitive responses. In addition, the argument strength x emotional state interaction was not statistically significant, $F(1, 249) = 1.46, p = .228, \eta^2 = .01$. This suggests that the

relationship between the proportion of negative cognitive responses and attitudes does not depend on whether people received strong or weak arguments.

Summary. There was a consistent argument strength effect on attitudes, net valence of cognitive responses, and the proportions of positive and negative cognitive responses. Overall, there were no significant differences between the joy and contentment conditions on any of the outcomes variables when participants read the weak arguments. However, for participants exposed to the strong message arguments, participants in the content (vs. joy) condition generated significantly more cognitive responses, while participants in the joy (vs. content) condition generated a greater proportion of positive cognitive response, which contributed to a more positive net valence.

Measured Emotion x Argument Strength Analyses: Joy and Content Only

Effects of measured emotion and argument strength manipulations on attitudes. The joy-contentment difference score, argument strength, and cross-product interaction term were simultaneously entered into a multiple regression as predictors of attitude scores. The predictors accounted for 17% of the variance in attitude scores, $F(3, 253) = 17.06, p < .001, \eta^2 = .17$. There was a significant main effect of argument strength, $t(255) = 6.52, p < .001, r = .38$. People exposed to strong arguments had more favorable attitudes compared to people exposed to weak arguments, $b = 1.05, \beta = -0.37$. There was not a statistically significant main effect of the joy-contentment difference score on attitudes, $t(255) = -1.30, p = .196, r = .08$.

This multiple regression analysis also revealed a statistically significant interaction between argument strength and the joy-contentment difference score, $t(255) = 1.99$, $p = .047$, $r = .12$. This result indicates that the relation between the difference score and attitudes depends on the strength of the argument (see Figure 4). Simple slopes tests revealed that emotion type (the difference score) was only related to attitudes when people were exposed to strong arguments, $b = .13$, $\beta = .24$, $t(122) = 2.73$, $p = .007$, $r = .24$. That is, in the strong argument condition, people's attitudes were more favorable when they felt joyful. However, in the weak argument condition, there was no relation between emotion and attitude, $b = -.003$, $\beta = -.006$, $t(131) = -.074$, $p = .941$, $r = .01$. When people were exposed to weak arguments, the extent to which they felt joyful or content had no impact on the favorability of their attitudes. Overall, experienced emotion accounted for 6% of the variance in attitudes when people were exposed to strong arguments, but 0% of the variance in attitudes when people were shown weak arguments.

These findings suggest that there is a difference in the effect of joy and contentment on the favorability of people's attitudes. Feelings of joy were associated with more favorable attitudes compared to feelings of contentment. However, this effect was only found using the joy-contentment difference score. In addition, the differences between joy and contentment were found in the strong argument condition, but not in the weak argument condition.

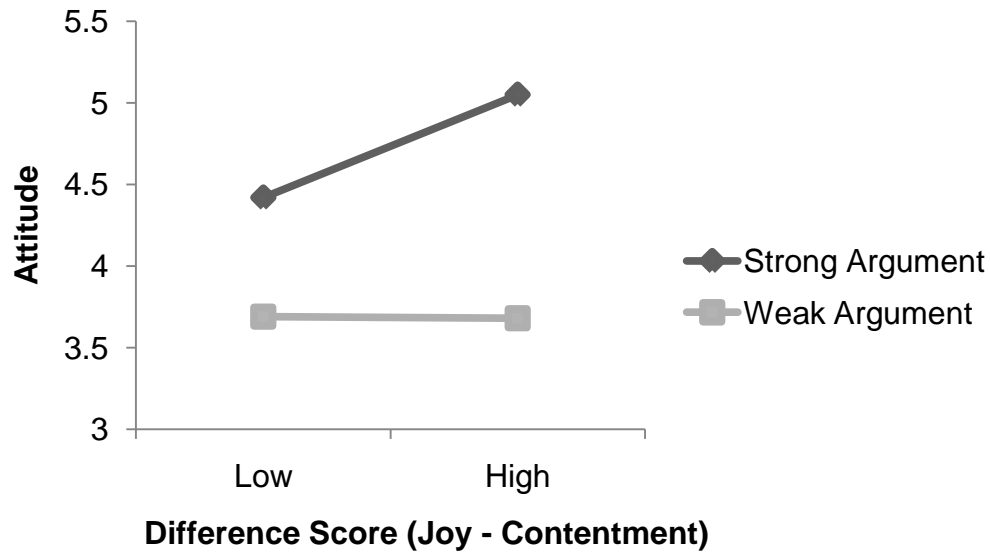


Figure 4. Predicting attitudes from argument strength and joy-contentment difference score.

Effects of measured emotion and argument strength manipulations on cognitive responses. Multiple regression analyses were used for the following analyses. The joy-contentment difference score, argument strength condition, and the cross-product interaction term were entered in the regression as simultaneous predictors.

Total number of relevant cognitive responses. The predictors did not account for a significant amount of variance in the total number of relevant cognitive responses, $F(3, 246) = 0.29, p = .834, \eta^2 = .00$.

Net valence of cognitive responses. The predictors accounted for 7.6% of the variance in the net valence of cognitive responses, $F(3, 246) = 6.74, p < .001, \eta^2 = .08$. There was a significant main effect of argument strength, $t(248) = 3.92, p < .001, r = .24$. People exposed to strong arguments generated more positive cognitive responses

compared to people exposed to weak arguments, $b = 1.15$, $\beta = .24$. The main effect of measured emotional state was not significant, $t(248) = -1.11$, $p = .267$, $r = .07$. In addition, the argument strength x joy-content difference score interaction was not significant, $t(248) = 1.61$, $p = .108$, $r = .10$.

Proportion of positive cognitive responses. The predictors accounted for 8% of the variance in the proportion of positive cognitive responses, $F(3, 246) = 7.95$, $p < .001$, $\eta^2 = .09$. There was a significant main effect of argument strength, $t(248) = 4.25$, $p < .001$, $r = .26$. People exposed to strong arguments generated more positive cognitive responses compared to people exposed to weak arguments, $b = 0.18$, $\beta = .27$. The main effect of emotional state was not significant, $t(248) = -1.26$, $p = .210$, $r = .08$. In addition, the argument strength x joy-content difference score interaction was not significant, $t(248) = 1.28$, $p = .202$, $r = .08$.

Proportion of negative cognitive responses. The predictors accounted for 6.5% of the variance in the proportion of negative cognitive responses, $F(3, 249) = 5.90$, $p < .001$, $\eta^2 = .07$. There was a significant main effect of argument strength, $t(248) = -3.58$, $p < .001$, $r = .22$. People exposed to strong arguments generated fewer negative cognitive responses compared to people exposed to weak arguments, $b = -.17$, $\beta = -.23$. The main effect of emotional state was not significant, $t(248) = 0.44$, $p = .663$, $r = .03$. In addition, the argument strength x joy-content difference score interaction was not significant, $t(248) = -0.84$, $p = .400$, $r = .05$.

Summary. Consistent with the hypotheses and previous sets of analyses, argument strength predicts more favorable attitudes and cognitive responses. The joy-

contentment difference score was not a significant predictor of attitudes or cognitive responses. However, there was a significant argument strength x difference score interaction predicting attitudes. When exposed to strong arguments, participants who experienced higher levels of joy reported more favorable attitudes.

DISCUSSION

The data analyses provided mixed support for the hypotheses. Across all analyses, there was a clear argument strength effect. Participants reported more favorable attitudes and cognitive responses when exposed to strong message arguments rather than weak message arguments (Hypothesis 1).

In contrast to predictions, participants in the joy and contentment conditions did not report more positive attitudes and cognitive responses compared to participants in the neutral condition (Hypothesis 2). Unexpectedly, participants in the content condition generated a significantly smaller proportion of cognitive responses and reported a more negative net valence compared to participants in the other two conditions. These findings are inconsistent with previous research which found that positive moods lead to more favorable attitudes compared to neutral moods (e.g., Petty, Schumann, Richman, & Strathman, 1993).

The analyses also revealed that, in some cases, there was a relationship between emotions and the dependent variables in the strong argument condition, but not in the weak argument condition. Specifically, in the strong argument condition, participants in the joy condition reported fewer cognitive responses, more positive net valences of cognitive responses, and higher proportions of positive cognitive responses compared to people in the

content condition. These findings are in the opposite direction than predicted (Hypotheses 3 and 4). Compared to the joy condition, participants in the content condition were expected to report more positive attitudes and cognitive responses in the strong argument condition, and more negative attitudes and cognitive responses in the weak argument condition. These findings would have indicated that people engage in more systematic processing when they are feeling content. Participants in the joy condition displayed the increased favorability of cognitive responses in the strong argument condition; however, they did not also show more negative cognitive responses in the weak argument condition. As a result, no clear conclusions can be made about the effects of joy on depth of processing.

While these findings do not support the hypothesis that joy and contentment lead to different process-style effects, it is apparent that joy and contentment do differ in their effects on cognitive responses to persuasive messages. Compared to joy, contentment was associated with more negative thoughts and attitudes. One interpretation of these findings is that people may attend more to positive information and interpret information more positively when they are feeling joyful compared to when they are feeling content. Joyful feelings are associated with enhanced creativity and idea generation (e.g., Fredrickson & Branigan, 2005; Fredrickson & Cohn, 2008; Izard, 2000), and these tendencies may be reflected in the increased generation of positive cognitive responses for participants in the joy condition.

Another interpretation of these findings is that participants in the content condition were more sensitive to potential disruptions or changes. Contentment is a lower arousal emotion compared to joy, and contentment is associated with certainty and satisfaction with

one's current situation (Fredrickson, 1998). In this study, participants read a persuasive message that proposed changes to the university by implementing comprehensive exams. Participants in the content condition may have perceived these changes as potentially threatening to the status quo and their feelings of contentment. Since people are generally motivated to maintain their positive affect (Wegener, Petty, & Smith, 1995), participants in the content condition may have evaluated the issue more negatively because it would have led to a change in their environment, which could potentially threaten their sense of contentment.

Strengths and Limitations

Prior research examined the effects of global positive mood and emotions on attitude change. For the most part, these studies did not assess discrete positive emotions, such as joy, contentment, amusement, and elation. A strength of the current research is that it attempted to differentiate between the effects of discrete positive emotions on persuasion. This initial effort focused specifically on the effects of joyful and content incidental emotions.

A limitation of this study is that participants did not receive a standard, controlled emotion manipulation. In this study, the emotion manipulation asked participants to think about and describe a joyful, content, or neutral experience in their life. Participant life experiences were used, because it was expected that participants would choose an event that was most emotionally salient to them. However, there are drawbacks associated with the emotional manipulation used in this study. There was wide variability in the types of experiences the participants recalled and the elicited emotions, which may have increased

the amount of noise in the data. In addition, although definitions of joyful, content, and neutral feelings were provided in the instructions, participants may have interpreted the instructions differently.

One of the challenges of studying discrete positive emotions is that positive emotions are often blended. People often experience a mixture of different types of positive emotions rather than only one specific emotion. Many of the participants in the joy and contentment conditions reported experiencing both joy and contentment when they recalled their positive experience. These blended emotions make it difficult to untangle the effects of one discrete emotion from another.

Suggestions for Future Research

Additional research is needed to understand the different effects that joy and contentment have on the way that people process persuasive messages and form attitudes about the topic.

To investigate the research questions further, a next step would be to replicate this study using a standardized emotion manipulation. For example, short film clips or stories could be used to elicit joyful and content feelings. While there are existing stimuli designed to elicit joyful feelings, additional research would be necessary to identify valid manipulations for contentment. Standardizing the emotion manipulation would reduce variability in the data, which may reveal greater effects of the emotion conditions on attitudes and cognitive responses to persuasive messages.

Future research may also examine how the intensity of the joyful or content feelings influences persuasion. Overall, participants tended to experience a moderate intensity of joy

and contentment. For the entire sample, the absolute percentile of joy was 56% and the absolute percentile of contentment was 59%. By condition, the absolute percentiles of joy for the neutral, content, and joy conditions were 29%, 69%, and 72%, and the absolute percentiles of contentment were 45%, 70%, and 64%, respectively. Additional research is necessary to examine the effects of extreme emotions. It's possible that the hypotheses would be confirmed if the participants experienced more intense feelings of joy and contentment.

In addition, future research should also examine the effects of other types of discrete positive emotions on persuasion. In particular, it would be useful to include an amusement manipulation in future studies, because humor is frequently used in persuasive messages. It seems likely that amusement would be associated with more heuristic processing and less systematic processing, because the amusement may distract or demotivate the audience from processing detailed arguments.

Previous research on discrete negative emotions has found that persuasion is greatest when the emotional tone of the message is congruent with the audience's current emotion (e.g., DeSteno et al., 2004). Another avenue of future research would be to see whether these results hold for discrete positive emotions as well. Joy-toned messages that emphasize playfulness and creativity may be more persuasive for people who are feeling joyful, while content-toned messages that emphasize ease and satisfaction with life may be more persuasive for people who are feeling content.

Finally, additional research is necessary to further understand how feelings of contentment influence persuasion. The present research found that people who are

feeling content may be more resistant to persuasive messages that are intended to change their attitudes. However, future studies should examine whether people who are feeling content may be more influenced by persuasive messages that are already consistent with their viewpoints. In other words, persuasive messages that are designed to bolster or strengthen attitudes may be more effective when the audience is feeling content.

Conclusion

The present study is a first attempt at distinguishing between the effects of joy and contentment on persuasion. The analyses provided mixed support for the hypotheses; however, it is clear that joy and contentment impact the persuasion process differently. Specifically, persuasive messages aimed at changing the audience's viewpoint may be less effective when people are feeling content rather than joyful.

APPENDIX A:
EMOTION MANIPULATION MATERIALS

Participants received one of the following instructions in order to induce a specific emotional state (contentment, joy, or neutral). Participants in all conditions reported when the event occurred.

1. General Instructions

We would like your help in the development of a “life-event inventory”—a test instrument to assess events in people’s lives. The following instructions will ask you to think about and describe a specific emotional event in your life. Your description of this event will help us generate items for the life-event inventory.

2a. Contentment Instructions

Please try to recall a previous pleasant emotional experience in which you felt extremely *content*. When you were feeling content, you may have had the urge to sit back and savor the experience.

Try and remember *as vividly as you can* what this past situation was like. Take a minute to think back and *re-experience* the emotions that you were feeling during this experience. What happened? How did you feel?

Please describe the pleasant emotional experience that you recalled.

2b. Joy Instructions

Please try to recall a previous pleasant emotional experience in which you felt extremely *joyful*. When you were feeling joyful, you may have had the urge to be playful or creative.

Try and remember *as vividly as you can* what this past situation was like. Take a minute to think back and *re-experience* the emotions that you were feeling during this experience. What happened? How did you feel?

Please briefly describe the pleasant emotional experience that you recalled.

2c. Neutral Instructions

Please try to recall a previous experience in which you felt *neutral*. When you were feeling neutral, you were not experiencing any positive or negative emotions.

Try and remember *as vividly as you can* what this past situation was like. Take a minute to think back and *re-experience* the emotions that you were feeling during this experience. What happened? How did you feel?

Please describe the experience that you recalled.

3. All Conditions (following description of experience)

How long ago did this event happen?

- ☐ Within the last week
- ☐ One week to one month ago
- ☐ One month to six months ago
- ☐ Six months to one year ago
- ☐ One year to three years ago
- ☐ Over three years ago

APPENDIX B:
STRONG AND WEAK ARGUMENT MANIPULATION MATERIALS

Strong Arguments

A comprehensive exam (or “comp”) is a test that students take during their senior year to evaluate their knowledge about their major. Loyola University Chicago does not currently require students to pass comprehensive exams in order to graduate; however, the university may choose to implement comprehensive exams in the future. Please read the following passages.

1. The National Scholarship Achievement Board recently revealed the results of a five-year study conducted on the effectiveness of comprehensive exams at Duke University. The results of the study showed that since the comprehensive exam has been introduced at Duke, the grade point average of undergraduates has increased by 31%. At comparable schools without the exams, grades increased by only 8% over the same period. The prospect of a comprehensive exam clearly seems to be effective in challenging students to work harder and faculty to teach more effectively. It is likely that the benefits observed at Duke University could also be observed at other universities that adopt the exam policy.
2. A study conducted by the Educational Testing Service of Princeton, New Jersey, revealed that most of the Ivy League schools and several of the Big 10 universities have senior comprehensive exams to maintain their academic excellence. Professors at those schools who were interviewed recently said that senior comprehensive exams assured that only high quality and knowledgeable students would be associated with the university. This, of course, increases the prestige of current students, alumni of the school, and the university as a whole. The exams should be instituted to increase the academic reputation of the university. A national educator’s publication recently predicted that within the next 10 years, the top universities would have the exam policy, and the weaker ones would not.
3. An interesting and important feature of the comprehensive exam requirement is that it has led to a significant improvement in the quality of undergraduate teaching in the schools where it has been tried. Data from the Educational Testing Service confirm that teachers and courses at the schools with comprehensive exams were rated more positively by students after exams than before. The improvement in teaching effectiveness appears to be due to departments placing more emphasis on high quality and stimulating teaching because departments look bad when their majors do poorly on the exam. For example, at the University of Florida, student ratings of courses increased significantly after comprehensive exams were instituted.

Weak Arguments

A comprehensive exam (or “comp”) is a test that evaluates a student’s knowledge about their major. Loyola University Chicago does not currently require students to pass comprehensive exams in order to graduate; however, the university may choose to implement comprehensive exams in the future. Please read the following passages.

1. The National Scholarship Achievement Board recently revealed the results of a study they conducted on the effectiveness of comprehensive exams at Duke University. One major finding was that student anxiety had increased by 31%. At comparable schools without the exam, anxiety increased by only 8%. The Board reasoned that anxiety over the exams, or fear of failure, would motivate students to study more in their courses while they were taking them. It is likely that this increase in anxiety observed at Duke University would also be observed and be of benefit at other universities that adopt the exam policy.
2. A study conducted by the Educational Testing Service of Princeton, New Jersey revealed that many universities are considering adopting comprehensive exams. Thus, any university that adopted the exams could be at the forefront of a national trend. Some professors at schools with the exams who were interviewed felt that high school students would be impressed by a university that kept pace with current trends. In fact, whether or not a school had a comprehensive exam might be a determining factor in their choice of a university. Therefore, the enrollments of universities with the exams should increase as the information about the exams spreads among high school students.
3. An interesting and important feature of the comprehensive exam requirement is that if the exams were instituted nationwide, students across the country could use the exam to compare their achievements with those of students at other schools. Data from the Educational Testing Service confirm that students are eager to compare their grades in a particular course with those of other students. Just imagine how exciting it would be for students in the Midwest to be able to compare their scores with those of students at the University of Florida, for example. This possibility for comparison would provide an incentive for students to study and achieve as high a score as possible so they would not be embarrassed when comparing scores with their friends.

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The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

Date

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